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(54) PRODUCT PACKAGING ASSEMBLY

PRODUKTVERPACKUNGSANORDNUNG

ENSEMBLE D'EMBALLAGE DE PRODUIT

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Description

[0001] The present invention relates to a product packaging assembly.

[0002] In the field of product packaging, the technology is known which allows to package each individual product by means of a respective wrapper that wraps around it, said wrapper being coupled to close by means of adhesive labels and/or glues that are distributed appropriately.

[0003] This production technology allows to obtain packages that differ almost exclusively in the color and quality of the wrapper or, at most, in an applied adhesive label.

[0004] In any case, especially for food products, the individual package has the purpose of protecting the product contained therein and of avoiding any contaminations thereof.

[0005] Packages of the known type allow to identify cases in which the package has already been opened and therefore the product may potentially have been exposed to contaminants. There are in fact packages that have safety seals (such as for example the above cited label) or comprise a pre-scoring lines which, as a consequence of the opening of the package, undergo a structural modification (breakage, damage or modification of the shape and/or dimensions) that makes it evident that opening has occurred.

[0006] However, packages of the known type offer no safety as regards the complete segregation of the product contained therein with respect to the outside environment and therefore are not suitable to avoid in an absolute manner any contaminations of the product.

[0007] Specifically, no wrapper packages are known which isolate the product completely from the outside environment and more particularly there are no packaging assemblies capable of providing wrappers with such characteristics.

[0008] EP-A-1 897 810 discloses an assembly for packaging products having a combination of features as set forth in the pre-characterizing portion of the appended claim 1.

[0009] The aim of the present invention is to solve the problems described above, by devising a product packaging assembly that is suitable to provide a wrapper that isolates the product completely from the outside environment, eliminating the risk of contamination caused for example by the passage of air from the inside to the outside of the wrapper and/or vice versa.

[0010] Within this aim, an object of the invention is to devise a product packaging assembly that is suitable to provide wrappers that have a high-value appearance and high quality standards.

[0011] Another object of the invention is to devise a product packaging assembly that is provided with means or other seals that show assuredly any tampering or opening of the provided package.

[0012] Another object of the invention is to devise a product packaging assembly that provides a wrapper,

even partially similar to those of the known type, by adopting a technical and structural architecture that is alternative to that of packaging machines of the known type.

[0013] A further object of the present invention is to provide a product packaging assembly that has low costs, is relatively simple to provide in practice and is safe in application.

[0014] In accordance with the invention, there is provided a product packaging assembly as defined in the appended claims.

[0015] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the product packaging assembly according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a rear lateral axonometric view of a product packaging assembly according to the invention;

Figure 2 is a front lateral axonometric view of a product packaging assembly according to the invention;

Figure 3 is a front lateral axonometric view, taken from below, of a product packaging assembly according to the invention;

Figure 4 is a side view of a product packaging assembly according to the invention;

Figure 5 is an enlarged-scale axonometric view of the product packaging assembly according to the invention.

[0016] With particular reference to the figures, the numeral 1 generally designates an assembly for packaging products A.

[0017] It is specified that in the examples shown in the accompanying figures and in the description that follows, reference shall be made predominantly to an assembly 1 for packaging chocolates, candy, cookies and food products in general.

[0018] Obviously, the assembly 1 according to the invention can be used likewise to package other products A that require similar packaging specifications.

[0019] The assembly 1 for packaging products A comprises at least one line 2 for supplying the products A to be packaged, at least one dispenser of covering sheets B, a plurality of handling devices 3 for juxtaposing a sheet B on a respective product A, and at least one line 4 for the exit of the packaged products A.

[0020] According to the invention, the handling devices 3 comprise a plurality of mutually cooperating components.

[0021] In particular, there is at least one movable gripper for picking up at least one individual product A from the at least one supply line 2 and for aligning said product with at least one respective packaging sheet B. The mov-

able gripper is therefore a device intended for so-called "pick and place" of products and as such can be chosen among those of the known type in accordance with the specific requirements.

[0022] The handling devices 3 comprise further at least one pusher 5 for the translation of the at least one product A along a trajectory that is incident to the at least one respective sheet B that is aligned therewith: said trajectory also provides for the crossing of folding contrasts (not shown in the accompanying figures since they are of a substantially known type) of the at least one sheet B along the at least one respective product A.

[0023] By way of example, it is specified that the folding contrasts might be constituted by rigid bodies intended to affect the flaps C of the sheet B during their passage (moved by the pusher 5): usually, the rigid bodies used as contrasts are laminas or bars and provide for the presence of brushes or bristles or generic elastically deformable protrusions on their surface intended to interact with the sheet B in order to force the sheet B onto the product A to ensure correct juxtaposition.

[0024] Furthermore, the handling devices 3 comprise at least one pair of clamping jaws 6 for the forced juxtaposition of the mutually opposite flaps C of the at least one sheet B.

[0025] In practice, by clamping the flaps C of the sheet B onto each other it is possible to achieve a perfect covering of the product A.

[0026] In particular, if the sheet has, on its surface intended to make contact with the product B (exclusively in the regions of the flaps C that will not make direct contact with the product B), bonding and/or adhesive substances D (and/or substances with a similar function), the jaws 6 ensure the perfect coupling of the facing and juxtaposed flaps C so that the bonding substances (and/or equivalents) that are present are mutually coupled hermetically.

[0027] In this manner it is possible to ensure that the product A arranged within the sheet B is isolated from the outside environment: the adhesive substances D (or equivalents) in fact ensure that the product A is sealed within the sheet B.

[0028] Moreover, the jaws 6, by progressively approaching the sheet B superimposed on the product A, also facilitate the expulsion of most of the air initially interposed between the product A and the sheet B (inside the package being formed): in the case of food products, the expulsion of the air is extremely advantageous, since it reduces the presence of oxygen in contact with the product A, minimizing oxidation processes and creating an environment that is unfavorable for the proliferation of bacteria and fungi. Of course, the fact that the package (wrapped sheet B) is subsequently sealed onto the product A by means of the adhesive substance D (or equivalent) arranged on the sheet B eliminates the possibility of gas exchanges between the inside of the package and the outside (thus preventing the entry of oxygen).

[0029] It should be specified that in order to ensure

optimum coupling of the mutually clamped flaps C (with the optional and advantageous interposition of an adhesive substance D or equivalent), the surfaces of the jaws 6 that abut against the at least one sheet B have respective complementarily shaped embossing.

[0030] This method of providing the surfaces of the jaws 6 causes the penetration of the raised portions of a first jaw 6 in the complementarily shaped recesses of the other jaw and vice versa, with the interposition of the flaps C of the sheet B. The clamping of the sheets is therefore particularly efficient, ensuring an optimum hermetic coupling thereof (by way of the presence of the adhesive substance D or equivalent).

[0031] Furthermore, the handling devices 3 comprise at least one abutment, for the folding of the portions of the juxtaposed flaps C arranged at the sides of the product A, with consequent alignment of the flaps with one face of the at least one product A so as to constitute a bundle 7 of gathered flaps C.

[0032] Downstream of the clamping jaws 6, the covered product A has a fan-like shape: substantially, the flaps C of the covered product A, shaped like a fan, arrange themselves beyond the plane that contains the base of said product A. According to a particular embodiment that allows to convey them outwardly in order to be able to ensure the action of the subsequent handling devices 3, it is necessary to provide for the presence of a specific abutment constituted by two elements 60 that move along a rectilinear path in a substantially radial direction (with respect to the arrangement of the partially packaged product A). The two elements 60 slide at the sides of the partially packaged product A and convey the heat-sealed flaps C, which are particularly rigid, so as to be able to ensure that the subsequent handling devices 3 act on the outside of the wrapper being formed. The two elements 60 can be simply shaped like two parallelepipeds arranged at the distance that allows exclusively the passage of the covered product A. Actually, preferably they can be contoured so as to better convey the flaps C of the sheet B that are arranged in a fan-like shape. It is possible to provide for the insertion, between the jaws 6 and the elements 60, of guides for the product A that have the purpose of assisting the conveyance of the flaps C: the presence of such guides is in any case to be considered optional and not relevant for the purposes of the operation of the assembly 1.

[0033] Finally, it should be specified that the handling devices 3 comprise at least one contoured clamping plate 8 for the transverse compaction of the bundle 7 of gathered flaps C.

[0034] The at least one plate 8 is provided with at least one heater for the controlled increase of its temperature.

[0035] The fact that the plate 8 is heated allows to render uniform the distribution of the adhesive substance D on the mutually coupled flaps C, facilitating an optimum coupling that ensures the perfect seal against gas exchanges between the inside of the package and the outside environment.

[0036] The contoured clamping plates 8 are two in number, are substantially mutually opposite and can move from a configuration of maximum mutual separation to a configuration of at least partial juxtaposition.

[0037] In the configuration of at least partial juxtaposition of the plates 8, the bundle 7 of gathered flaps C is interposed and clamped between corresponding perimetric regions of said plates 8.

[0038] It is useful to point out that each plate 8 can effectively have a substantially V-shaped recess 9 in its end edge.

[0039] Such recess 9 faces the bundle 7 of gathered flaps C.

[0040] The perimetric regions suitable to clamp the bundle 7 of flaps C are defined substantially at the vertex of the V-shaped recess 9.

[0041] The two plates 8, during clamping, substantially behave like a sort of guillotine intended to minimize the transverse space occupation of the bundle 7 of flaps C, therefore compacting said flaps C (until the gaps that are present between the flaps C are substantially eliminated): this clamping increases the quality of the coupling between said flaps C (with the interposition of the adhesive substance D and/or equivalent) in order to ensure the optimum tightness of said coupling (intended to avoid also gas exchanges from the inside to the outside of the package).

[0042] According to a particular constructive solution of unquestionable interest in practice and in application, the assembly 1 comprises specific rotatable grip means 10 which face the bundle 7 of gathered flaps C and are substantially aligned with the plates 8 when they are in the at least partially juxtaposed configuration.

[0043] The rotatable grip means have the purpose of clamping the free end of the bundle 7 of the flaps C and of rotating it with respect to the product A covered by the remaining portion of sheet B, with consequent further compaction of at least one part of the bundle 7 of gathered flaps C.

[0044] The twisting of the bundle 7 in fact produces a compaction thereof (at the twisted region).

[0045] The twisting of the bundle 7 can be performed before or after the clamping performed with the heated plates 8.

[0046] According to a specific application, it has been found that performing twisting with the rotatable grip means 10 before the clamping of the plates 8 allows later (i.e., during the clamping of said heated plates 6) to achieve a better overall compaction of the package and therefore to ensure perfect isolation of the product A packaged with the sheet B with respect to the outside environment.

[0047] With particular reference to an embodiment that ensures high quality standards of the final package, the contoured pusher 5 can comprise a unit 11 for retaining the product A which is arranged substantially at its centerline.

[0048] In turn, the retention unit 11 is provided with

laminar lateral protrusions 12 for the alignment of the lateral flaps C of the sheet B during the crossing of the folding contrasts.

[0049] The lateral protrusions 12 are contoured so as to have a respective edge that is aligned with the bottom of the product A, so as to ensure that, during the folding of the sheet B induced by the folding contrasts, the sheet B remains with the folded edge aligned with the bottom of the product A, avoiding creases or irregular folding of said sheet B (which might compromise the correct seal of the package being prepared).

[0050] By observing the accompanying figures, it can be noted that the contoured protrusions 12 can have a height that increases in a radial direction, the maximum value of which (which corresponds to the height at which the bottom of the product A retained by the unit 11 is located) is at the maximum distance from said unit.

[0051] It is deemed useful to specify that an embodiment that allows to obtain a package that is particularly refined and valuable from an aesthetic standpoint entails that the embossed surfaces of the jaws 6 comprise a plurality of consecutive and alternating ridges and grooves (of the type of a scored, toothed surface and the like): each ridge of the surface of a first jaw 6 is aligned with a respective groove of the surface of the second jaw 6 and each groove of the surface of a first jaw 6 is aligned with a respective ridge of the surface of the second jaw 6.

[0052] In this manner, the compression of the two flaps C onto each other (with the interposition of the adhesive substance D or equivalent) is optimum and ensures perfect tightness of their coupling.

[0053] In order to increase further the quality of the coupling between the two flaps C at the jaws 6, their embossed surfaces are preferably made of elastically deformable material, of a type chosen preferably among elastomers, polymers and the like.

[0054] It is useful to point out that the assembly 1 comprises, downstream of the at least one heated clamping plate 8, a labeling unit 13 provided with means 14 for locking the bundle 7 of gathered flaps C and at least one apparatus 15 for picking up and gluing the labels 16.

[0055] Such apparatus 15 can move from a first configuration for picking up at least one individual label 16 from a respective dispenser 17 (pickup configuration, in which the apparatus 15 is aligned with said dispenser 17), to a second configuration for the application of the label 16 on the bundle 7 of gathered flaps C (application configuration, in which the apparatus 15 is aligned with said bundle 7).

[0056] The apparatus 15 comprises two contoured elements, which pick up the label 16 from the dispenser 17, accommodating it on a surface that is defined by two aligned and contiguous faces thereof.

[0057] During the application of the label 16 to the bundle 7, the two elements mutually space and rotate around the bundle 7 on opposite sides thereof so as to cover it completely.

[0058] Once complete covering has been performed,

the two faces that retained the label 16 are juxtaposed so as to facilitate the mutual coupling of the end parts of said label 16 (which thus constitutes an actual closure seal for the produced package).

[0059] It should be specified that in order to improve the adhesion of the label 16 and prevent it from detaching subsequently (on the finished product, for example when it is put on sale), the surfaces 15a for accommodating the label 16 of the apparatus 15 preferably comprise a plurality of complementary and mated protrusions 15b and recesses 15c.

[0060] In particular, it is possible to detect the presence of a series of consecutive protrusions 15b and recesses 15c (which determine a substantially undulated shape of said surfaces, constituted by a sequence of protrusions and recesses) on each surface 15a.

[0061] The fact that the protrusions 15b and the recesses 15c are complementary and mated entails that, by arranging face to face and aligning the two surfaces 15a of the two jaws of the apparatus 15, the protrusions 15b of a first surface 15a are aligned with the recesses 15c of a second surface 15a.

[0062] More specifically, during the clamping of the label 16 on the bundle 7 of gathered flaps C, each protrusion 15b of a first surface 15a is accommodated at least partially within a respective recess 15c of a second surface 15b and vice versa.

[0063] This particular shape ensures that the label 16 is subjected to forcing on the bundle 7 of flaps C due to the partial mutual penetration of the surfaces 15a of the apparatus 15.

[0064] In this manner it is possible to ensure an optimum adhesion of the labels 16 and therefore a higher uniformity and regularity of the packaged finished products.

[0065] It is specified that the best results can be obtained by using inserts made of elastically deformable material (for example an elastomer) to constitute the surfaces 15a (and therefore also the corresponding protrusions 15b and recesses 15c).

[0066] The use of deformable materials ensures a mutual adaptation of the shape of the protrusions 15b and of the recesses 15c when they are mutually clamped.

[0067] The movable gripper (intended to pick up the products A from the supply line 2 and deliver them to the pusher 5) preferably comprises a fixed main body, with respect to which an arm on which the supporting rod of said clamp is pivoted can rotate.

[0068] The clamp therefore can move, integrally with the arm, with respect to the main body, from a configuration of alignment with the at least one supply line 2 to pick up at least one individual product A to a configuration of alignment with at least one respective packaging sheet B.

[0069] Furthermore, said clamp is also movable, integrally with respect to the respective supporting rod, from a configuration for picking up at least one individual product A to a configuration for delivering the at least one

individual product A, which is rotated through 180° with respect to the pickup configuration.

[0070] In this manner the clamp can also rotate the product A to deliver it to the pusher 5 according to the arrangement that is suitable for correct packaging thereof.

[0071] The assembly 1 according to the invention comprises further at least one transfer wheel 18, which is provided, on its substantially perimetric edge, with retention means for the product A covered by the sheet B arranged with the bundle 7 of gathered flaps C radially directed outwardly.

[0072] With particular reference to assemblies intended for the handling of food products and/or delicate products, at least one of the components chosen among the at least one movable gripper, the rotatable grip means 10 and the means for coupling the wheel 18 and the retention unit 11 comprises surfaces for contact with the product A, with the optional interposition of said sheet B, which have a predefined deformability, of the type of an elastomer, a polymeric foam and the like.

[0073] This ensures that even during the clamping of the product A the component does not deform said product A and does not deform its outer surfaces.

[0074] More particularly, it is noted that the surfaces of contact with the product A of at least one component chosen between the at least one movable gripper, the rotatable grip means, the locking unit 11 and the coupling means of the wheel 18 can comprise at least one sucker.

[0075] Advantageously, therefore, the present invention solves the problems described earlier, proposing the assembly 1 for the packaging of products A that is suitable to provide a wrapper that isolates completely the product from the outside environment, eliminating the risk of contamination caused, for example, by the passage of air from the inside to the outside of the wrapper and/or vice versa.

[0076] As shown previously, this is possible preferentially by adopting covering sheets B provided with an adhesive substance D along predefined portions of their flaps C.

[0077] In relation to the adoption of heated contoured plates 8, by using sheets B made of thermoplastic material it would in any case be possible to obtain the same result by means of a process for heat-sealing the bundle 7 of flaps C.

[0078] Furthermore, it has already been shown that the presence of the heated plates 8 is extremely useful also if a sheet B provided with adhesive substance D (or equivalent) is processed, since the thermal energy that is transferred to the bundle 7 during its compression facilitates the correct diffusion and distribution of said adhesive substance and in many cases contributes also to accelerate its cross-linking (and therefore the consolidation of the coupling of the flaps C provided thereby).

[0079] Usefully, the assembly 1 for packaging products A according to the invention is suitable to provide wrappers that have a high-value appearance and high quality

standards by way of the presence of the many refinements described previously, intended to maintain ideal alignments of the flaps C during packaging.

[0080] Advantageously, the unit 1 provides a package that has means or other seals that show with assurance any tampering or opening of the provided package (such as for example the label 16).

[0081] Validly, the assembly 1 provides a wrapper, even partially similar to those of the known type, by adopting a technical and structural architecture that is alternative to that of known types of packaging machine.

[0082] Effectively, the assembly 1 has substantially modest embodiment costs and is relatively simple to provide in practice: these characteristics make it a packaging assembly that is safe in application.

[0083] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; furthermore, all the details may be replaced with other technically equivalent elements.

[0084] For example, it is possible to provide for the presence of specific edges suitable to provide contoured incisions on the flaps C of the sheet B.

[0085] These edges, which are integral with the pusher 5, create a V-shaped incision on the flaps C in order to facilitate the coupling of said flaps C (for example gluing by means of the adhesive substance D), preventing the creation, on the flaps folded onto the protrusions 12, of a coupling discontinuity (region in which adhesive bonding is not complete), which might allow circulation of air from the inside to the outside of the package and vice versa.

[0086] In the examples of embodiment shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other examples of embodiment.

[0087] In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

[0088] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An assembly for packaging products (A) of the type comprising at least one line (2) for supplying the products (A) to be packaged, at least one dispenser of covering sheets (B), a plurality of handling devices (3) for juxtaposing a said sheet (B) on a respective product (A), and at least one output line (4) for the packaged products (A), said handling devices (3) comprising:

- at least one pusher (5) for the translation of said at least one product (A) along a trajectory that is incident to said at least one respective sheet (B) aligned therewith and with contrasts for folding said at least one sheet (B) on said at least one product (A);
- at least one pair of clamping jaws (6) for the forced juxtaposition of the mutually opposite flaps (C) of said at least one sheet (B);
- at least one abutment for folding the portions of said juxtaposed flaps (C) that are arranged at the sides of said product (A), with consequent alignment of said flaps (C) with one face of said at least one product (A) so as to constitute a bundle (7) of gathered flaps (C);
- at least one contoured clamping plate (8) for the transverse compaction of said bundle (7) of gathered flaps (C), said at least one plate (8) being provided with at least one heater for the controlled increase of its temperature; the assembly being **characterized in that** it further comprises:

- at least one movable gripper for picking up at least one individual product (A) from said at least one supply line (2) and for aligning it with at least one respective packaging sheet (B);
- the surfaces of said jaws (6) that abut against said at least one sheet (B) having a complementarily shaped embossing for the penetration of the raised portions of one jaw (6) in the complementarily shaped recesses of the other jaw and vice versa, with the interposition of said flaps (C).

2. The assembly according to claim 1, **characterized in that** it comprises, downstream of said at least one heated clamping plate (8), a labeling unit (13) provided with means (14) for locking said bundle (7) of gathered flaps (C) and at least one apparatus (15) for picking up and gluing said labels (16), said apparatus (15) being movable from a first configuration for picking up at least one individual label (16) from a respective dispenser (17) in which it is aligned with said dispenser (17), to a second configuration for application of the label (16) on the bundle (7) of gathered flaps (C) in which it is aligned with said bundle (7), the surfaces (15a) for accommodating the label (16) of said apparatus (15) comprising a plurality of complementary and mated protrusions (15b) and recesses (15c), during the clamping of said label (16) on the bundle (7) of gathered flaps (C) each protrusion (15b) of a first surface (15a) being accommodated at least partially within a respective recess (15c) of a second surface (15b) and vice versa.

3. The assembly according to claim 1, **characterized**

in that said contoured clamping plates (8) are two in number, are substantially mutually opposite and can move from a configuration of maximum mutual separation to a configuration of at least partial juxtaposition, in which said bundle (7) of gathered flaps (C) is interposed and clamped between corresponding perimetric regions of said plates (8).

4. The assembly according to claim 3, **characterized in that** each one of said plates (8) has a recess (9) that is substantially V-shaped in its end edge, which faces said bundle (7) of grouped flaps (C), said perimetric regions being defined substantially at the vertex of said V-shaped recess (9).

5. The assembly according to claim 1, **characterized in that** it comprises rotatable grip means (10), which face said bundle (7) of gathered flaps (C), for clamping the free end of said bundle (7) and its rotation with respect to said product (A) covered by the remaining portion of sheet (B), with consequent further compaction of at least one part of said bundle (7) of gathered flaps (C).

6. The assembly according to claim 1, **characterized in that** said contoured pusher (5) comprises a unit (11) for retaining the product (A), which is arranged substantially at its centerline and is provided with laminar lateral protrusions (12) for the alignment of the lateral flaps (C) of the sheet (B) during the crossing of said folding contrasts.

7. The assembly according to claim 1, **characterized in that** said embossed surfaces of said jaws (6) comprise a plurality of consecutive and alternating ridges and grooves, each ridge of the surface of a first jaw (6) being aligned with a respective groove of the surface of the second jaw (6), each groove of the surface of a first jaw (6) being aligned with a respective ridge of the surface of the second jaw (6).

8. The assembly according to claim 7, **characterized in that** said embossed surfaces of said jaws (6) are made of elastically deformable material, of a type chosen preferably among elastomers, polymers and the like.

9. The assembly according to one or more of the preceding claims, **characterized in that** said movable gripper comprises a fixed main body with respect to which an arm can rotate on which the supporting rod of said gripper is pivoted, said gripper being movable integrally with said arm with respect to said main body from a configuration of alignment with said at least one supply line (2) to pick up at least one individual product (A) to a configuration of alignment with at least one respective packaging sheet (B), said gripper being also movable, integrally with the re-

spective supporting rod, from a configuration for picking up at least one individual product (A) to a configuration for delivering said at least one individual product (A), which is rotated through 180° with respect to the pickup configuration.

10. The assembly according to one or more of the preceding claims, **characterized in that** it comprises at least one transfer wheel (18) that is provided, on its substantially perimetric edge, with coupling means for said product (A) covered by said sheet (B), said product (A) being arranged with said bundle (7) of gathered flaps (C) directed radially outward.

11. The assembly according to one or more of the preceding claims, **characterized in that** at least one component chosen among said at least one movable gripper, said rotatable grip means, said retention unit (11) and said coupling means of said wheel (18) comprises surfaces for contact with said product (A), with the optional interposition of said sheet (B), which have a predefined deformability, of the type of an elastomer, a polymeric foam and the like.

12. The assembly according to one or more of the preceding claims, **characterized in that** the surfaces of contact of at least one component chosen among said at least one movable gripper, said rotatable grip means, said retention unit (11) and said coupling means of said wheel (18) with said product comprises at least one sucker.

13. The assembly according to one or more of the preceding claims, **characterized in that** said at least one abutment, for the folding of the portions of said juxtaposed flaps (C) arranged at the sides of said product (A), with consequent alignment of said flaps (C) with a face of said at least one product (A) so as to constitute a bundle (7) of gathered flaps (C), comprises two elements (60), which can slide parallel to said partially packaged product (A) for the conveyance of the coupled flaps (C).

Patentansprüche

1. Eine Anordnung zum Verpacken von Produkten (A), von dem Typ, der Folgendes umfasst: mindestens eine Linie (2) zum Zuführen der zu verpackenden Produkte (A), mindestens einen Spender für Verpackungsfolien (B), eine Vielzahl von Handhabungsvorrichtungen (3) zum Legen der Folie (B) auf ein entsprechendes Produkt (A) und mindestens eine Ausgabelinie (4) für die verpackten Produkte (A), wobei die Handhabungsvorrichtungen (3) Folgendes umfassen:

- mindestens einen Schieber (5) zur Überfüh-

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wobei die Anordnung **dadurch gekennzeichnet ist, dass** sie weiter Folgendes umfasst:

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2. Die Anordnung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** sie, stromabwärts von der mindestens einen erwärmten Klemmplatte (8), eine Etikettiereinheit (13) umfasst, ausgestattet mit Mitteln (14) zum Fixieren des Bündels (7) gefalteter Flügel (C), und mindestens eine Vorrichtung (15) zum Aufnehmen und Kleben der Etiketten (16), wobei die Vorrichtung (15) aus einer ersten Konfiguration zum Aufnehmen mindestens eines einzelnen Etiketts (16) aus einem entsprechenden Spender (17), in der es mit dem Spender (17) angeordnet ist, in eine zweite Konfiguration zum Auftragen des Etiketts (16) auf das Bündel (7) gefalteter Flügel (C), in welcher es mit dem Bündel (7) ausgerichtet ist, bewegt werden kann, wobei die Oberflächen (15a) zum Aufnehmen des Etiketts (16) der Vorrichtung (15) eine Vielzahl komplementärer und zusammenpassender Vor-

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3. Die Anordnung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die konturierten Klemmplatten (8) zwei an der Zahl sind, im Wesentlichen einander gegenüberliegen und sich aus einer Konfiguration maximaler Trennung voneinander in eine Konfiguration zumindest partieller Anordnung nebeneinander bewegen können, in welcher das Bündel (7) gefalteter Flügel (C) zwischen entsprechenden Umfangsbereichen der Platten (8) angeordnet und geklemmt ist.

4. Die Anordnung gemäß Anspruch 3, **dadurch gekennzeichnet, dass** jede der Platten (8) eine Vertiefung (9) hat, die an ihrer Endkante, die dem Bündel (7) gruppierter Flügel (C) zugewandt ist, im Wesentlichen V-förmig ist, wobei die Umfangsbereiche im Wesentlichen am Scheitelpunkt der V-förmigen Vertiefung (9) bestimmt sind.

5. Die Anordnung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** sie drehbare Greifmittel (10) umfasst, die dem Bündel (7) gefalteter Flügel (C) zugewandt sind, zum Klemmen des freien Endes des Bündels (7) und zum Zwecke seiner Drehung mit Bezug auf das Produkt (A), das vom restlichen Abschnitt der Folie (B) bedeckt ist, mit daraus folgendem weiterem Zusammendrücken mindestens eines Teils des Bündels (7) gefalteter Flügel (C).

6. Die Anordnung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der konturierte Schieber (5) eine Einheit (11) zum Halten des Produkts (A) umfasst, die im Wesentlichen an seiner Mittellinie angeordnet und mit laminaren seitlichen Vorsprüngen (12) zur Ausrichtung der seitlichen Flügel (C) der Folie (B) während des Kreuzens der Faltkontraste ausgestattet ist.

7. Die Anordnung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die geprägten Oberflächen der Backen (6) eine Vielzahl aufeinander folgender und sich abwechselnder Grate und Nuten umfassen, wobei jeder Grat der Oberfläche einer ersten Backe (6) mit einer entsprechenden Nut der Oberfläche der zweiten Backe (6) ausgerichtet ist und jede Nut der Oberfläche einer ersten Backe (6) mit einem entsprechenden Grat der Oberfläche der zweiten Backe (6) ausgerichtet ist.

8. Die Anordnung gemäß Anspruch 7, **dadurch ge-**

kennzeichnet, dass die geprägten Oberflächen der Backen (6) aus elastisch verformbarem Material bestehen, von der Art, die vorzugsweise aus Elastomeren, Polymeren und dergleichen ausgewählt ist.

9. Die Anordnung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** der bewegliche Greifer einen festen Hauptkörper umfasst, im Verhältnis zu welchem ein Arm sich drehen kann, an dem die Stützstange des Greifers drehgelenkig gelagert ist, wobei der Greifer integral mit dem Arm mit Bezug auf den Hauptkörper beweglich ist aus einer Konfiguration der Ausrichtung mit der mindestens einen Zuführlinie (2), zum Aufnehmen mindestens eines einzelnen Produkts (A), in eine Konfiguration der Ausrichtung mit mindestens einer entsprechenden Verpackungsfolie (B), wobei der Greifer auch, integral mit der entsprechenden Stützstange, beweglich ist aus einer Konfiguration zum Aufnehmen mindestens eines einzelnen Produkts (A) in eine Konfiguration zum Abgeben des mindestens einen einzelnen Produkts (A), welche um 180° mit Bezug auf die Aufnahmekonfiguration gedreht ist.
10. Die Anordnung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** sie mindestens ein Transferrad (18) umfasst, welches an seiner im Wesentlichen perimetrischen Kante mit Kopplungsmitteln für das von der Folie (B) bedeckte Produkt (A) ausgestattet ist, wobei das Produkt (A) mit dem Bündel (7) gefalteter Flügel (C) radial nach außen gerichtet angeordnet ist.
11. Die Anordnung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** mindestens eine Komponente, gewählt aus dem mindestens einen beweglichen Greifer, den drehbaren Greifmitteln, der Halteeinheit (11) und den Kopplungsmitteln des Rades (18), Oberflächen für den Kontakt mit dem Produkt (A) umfasst, mit optionaler Anordnung der Folie (B) dazwischen, die eine vordefinierte Verformbarkeit haben, vom Typ eines Elastomers, eines Polymerschaums und dergleichen.
12. Die Anordnung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Kontaktflächen mindestens einer Komponente, gewählt aus dem mindestens einen beweglichen Greifer, den drehbaren Greifmitteln, der Halteeinheit (11) und den Mitteln zur Kopplung des Rades (18) mit dem Produkt mindestens einen Saugnapf umfassen.
13. Die Anordnung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** das mindestens eine Widerlager zum Falten

der Abschnitte der nebeneinander angeordneten Flügel (C), angeordnet an den Seiten des Produkts (A), mit daraus folgender Ausrichtung der Flügel (C) mit einer Seite des mindestens einen Produkts (A), um so ein Bündel (7) gefalteter Flügel (C) zu bilden, zwei Elemente (60) umfasst, die zur Beförderung der gekoppelten Flügel (C) parallel zu dem teilverpackten Produkt (A) gleiten können.

Revendications

1. Ensemble destiné à emballer des produits (A) du type comportant au moins une ligne (2) pour fournir les produits (A) à emballer, au moins un distributeur de feuilles de recouvrement (B), une pluralité de dispositifs de manipulation (3) pour juxtaposer une dite feuille (B) sur un produit (A) respectif, et au moins une ligne de sortie (4) pour les produits (A) emballés, lesdits dispositifs de manipulation (3) comportant :

- au moins un poussoir (5) pour la translation dudit au moins un produit (A) le long d'une trajectoire qui est dirigée vers ladite au moins une feuille (B) respective alignée avec celui-ci et avec des éléments en opposition pour plier ladite au moins une feuille (B) sur ledit au moins un produit (A) ;
- au moins une paire de mâchoires de serrage (6) pour la juxtaposition forcée des rabats mutuellement opposés (C) de ladite au moins une feuille (B) ;
- au moins une butée pour plier les portions desdits rabats juxtaposés (C) qui sont agencées sur les côtés dudit produit (A), avec un alignement conséquent desdits rabats (C) avec une face dudit au moins un produit (A) de manière à constituer un lot (7) de rabats groupés (C) ;
- au moins une plaque de serrage à contour façonné (8) pour le compactage transversal dudit lot (7) de rabats groupés (C), ladite au moins une plaque (8) étant pourvue d'au moins un élément chauffant pour l'augmentation commandée de sa température,

l'assemblage étant **caractérisé en ce qu'il** comporte en outre :

- au moins une pince mobile pour saisir au moins un produit (A) individuel à partir de ladite au moins une ligne d'alimentation (2) et pour l'aligner avec au moins une feuille d'emballage (B) respective ;
- les surfaces desdites mâchoires (6) qui viennent en butée contre ladite au moins une feuille (B) ayant un bossage de forme complémentaire pour la pénétration des portions en relief d'une mâchoire (6) dans les évidements de forme

complémentaire de l'autre mâchoire, et vice versa, avec l'interposition desdits rabats (C).

2. Ensemble selon la revendication 1, **caractérisé en ce qu'il** comporte, en aval de ladite au moins une plaque de serrage chauffée (8), une unité d'étiquetage (13) pourvue de moyens (14) pour bloquer ledit lot (7) de rabats groupés (C) et au moins un appareil (15) pour saisir et coller lesdites étiquettes (16), ledit appareil (15) étant mobile depuis une première configuration pour saisir au moins une étiquette individuelle (16) à partir d'un distributeur (17) respectif dans laquelle il est aligné avec ledit distributeur (17), jusqu'à une seconde configuration pour l'application de l'étiquette (16) sur le lot (7) de rabats groupés (C) dans laquelle il est aligné avec ledit lot (7), les surfaces (15a) pour recevoir l'étiquette (16) dudit appareil (15) comportant une pluralité de saillies (15b) et d'évidements (15c) complémentaires et appariés, pendant le serrage de ladite étiquette (16) sur le lot (7) de rabats groupés (C), chaque saillie (15b) d'une première surface (15a) étant reçue au moins partiellement à l'intérieur d'un évidement (15c) respectif d'une seconde surface (15b), et vice versa. 5 10 15 20 25 30 35
3. Ensemble selon la revendication 1, **caractérisé en ce que** lesdites plaques de serrage à contour façonné (8) sont au nombre de deux, sont sensiblement mutuellement opposées et peuvent se déplacer depuis une configuration de séparation mutuelle maximale jusqu'à une configuration de juxtaposition au moins partielle, dans laquelle ledit lot (7) de rabats groupés (C) est interposé et serré entre des zones périmétriques correspondantes desdites plaques (8). 30 35
4. Ensemble selon la revendication 3, **caractérisé en ce que** chacune desdites plaques (8) a un évidement (9) qui est sensiblement en forme de V sur son bord d'extrémité, qui est dirigé vers ledit lot (7) de rabats groupés (C), lesdites zones périmétriques étant définies pratiquement au sommet dudit évidement en forme de V (9). 40
5. Ensemble selon la revendication 1, **caractérisé en ce qu'il** comporte des moyens de préhension rotatifs (10), qui sont dirigés vers ledit lot (7) de rabats groupés (C), pour serrer l'extrémité libre dudit lot (7) et sa rotation par rapport audit produit (A) recouvert par la portion restante de la feuille (B), avec un compactage supplémentaire conséquent d'au moins une partie dudit lot (7) de rabats groupés (C). 45 50
6. Ensemble selon la revendication 1, **caractérisé en ce que** ledit poussoir à contour façonné (5) comporte une unité (11) pour retenir le produit (A), qui est agencée sensiblement sur son axe et est munie de saillies latérales lamellaires (12) pour l'alignement des ra-

bats latéraux (C) de la feuille (B) pendant le croisement desdits éléments de pliage en opposition.

7. Ensemble selon la revendication 1, **caractérisé en ce que** lesdites surfaces bosselées desdites mâchoires (6) comportent une pluralité de nervures et de rainures consécutives et alternées, chaque nervure de la surface d'une première mâchoire (6) étant alignée avec une rainure respective de la surface de la seconde mâchoire (6), chaque rainure de la surface d'une première mâchoire (6) étant alignée avec une nervure respective de la surface de la seconde mâchoire (6). 5 10 15
8. Ensemble selon la revendication 7, **caractérisé en ce que** lesdites surfaces bosselées desdites mâchoires (6) sont constituées d'un matériau élastiquement déformable, d'un type choisi de préférence parmi des élastomères, des polymères et analogue. 20 25
9. Ensemble selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite pince mobile comporte un corps principal fixe par rapport auquel un bras peut tourner sur lequel la tige de support de ladite pince pivote, ladite pince étant mobile d'un seul tenant avec ledit bras par rapport audit corps principal depuis une configuration d'alignement avec ladite au moins une ligne d'alimentation (2) pour saisir au moins un produit (A) individuel jusqu'à une configuration d'alignement avec au moins une feuille d'emballage (B) respective, ladite pince étant également mobile, solidairement avec la tige de support respective, depuis une configuration pour saisir au moins un produit (A) individuel jusqu'à une configuration pour délivrer ledit au moins un produit (A) individuel, qui est tourné à 180° par rapport à la configuration de saisie. 30 35 40
10. Ensemble selon une ou plusieurs des revendications précédentes, **caractérisé en ce qu'il** comporte au moins une roue de transfert (18) qui est pourvue, sur son bord sensiblement périmétrique, de moyens de couplage pour ledit produit (A) recouvert par ladite feuille (B), ledit produit (A) étant agencé avec ledit lot (7) de rabats groupés (C) dirigé radialement vers l'extérieur. 45 50
11. Ensemble selon une ou plusieurs des revendications précédentes, **caractérisé en ce qu'au** moins un composant choisi parmi ledit au moins une pince mobile, lesdits moyens de préhension rotatifs, ladite unité de retenue (11) et lesdits moyens de couplage de ladite roue (18) comporte des surfaces pour un contact avec ledit produit (A), avec l'interposition facultative de ladite feuille (B), qui ont une déformabilité prédéfinie, du type d'un élastomère, d'une mousse polymère et analogue. 55

12. Ensemble selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** les surfaces de contact d'au moins un composant choisi parmi ledit au moins une pince mobile, lesdits moyens de préhension rotatifs, ladite unité de retenue (11) et lesdits moyens de couplage de ladite roue (18) avec ledit produit comporte au moins une ventouse.

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13. Ensemble selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite au moins une butée, pour le pliage des portions desdits rabats (C) juxtaposés agencés sur les côtés dudit produit (A), avec un alignement conséquent desdits rabats (C) avec une face dudit au moins un produit (A) de manière à constituer un lot (7) de rabats groupés (C), comporte deux éléments (60), qui peuvent coulisser parallèlement audit produit (A) partiellement emballé pour le transport des rabats groupés (C).

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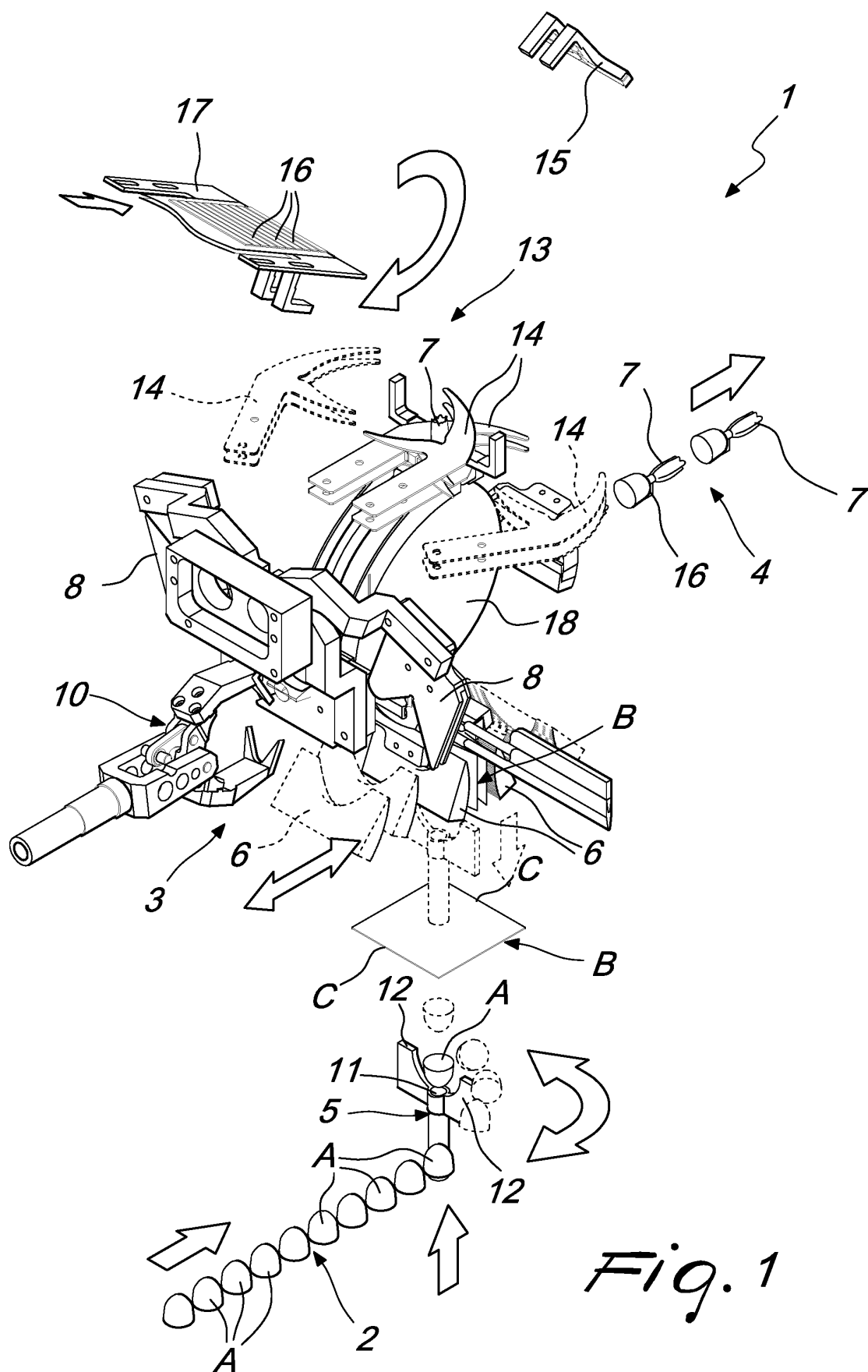
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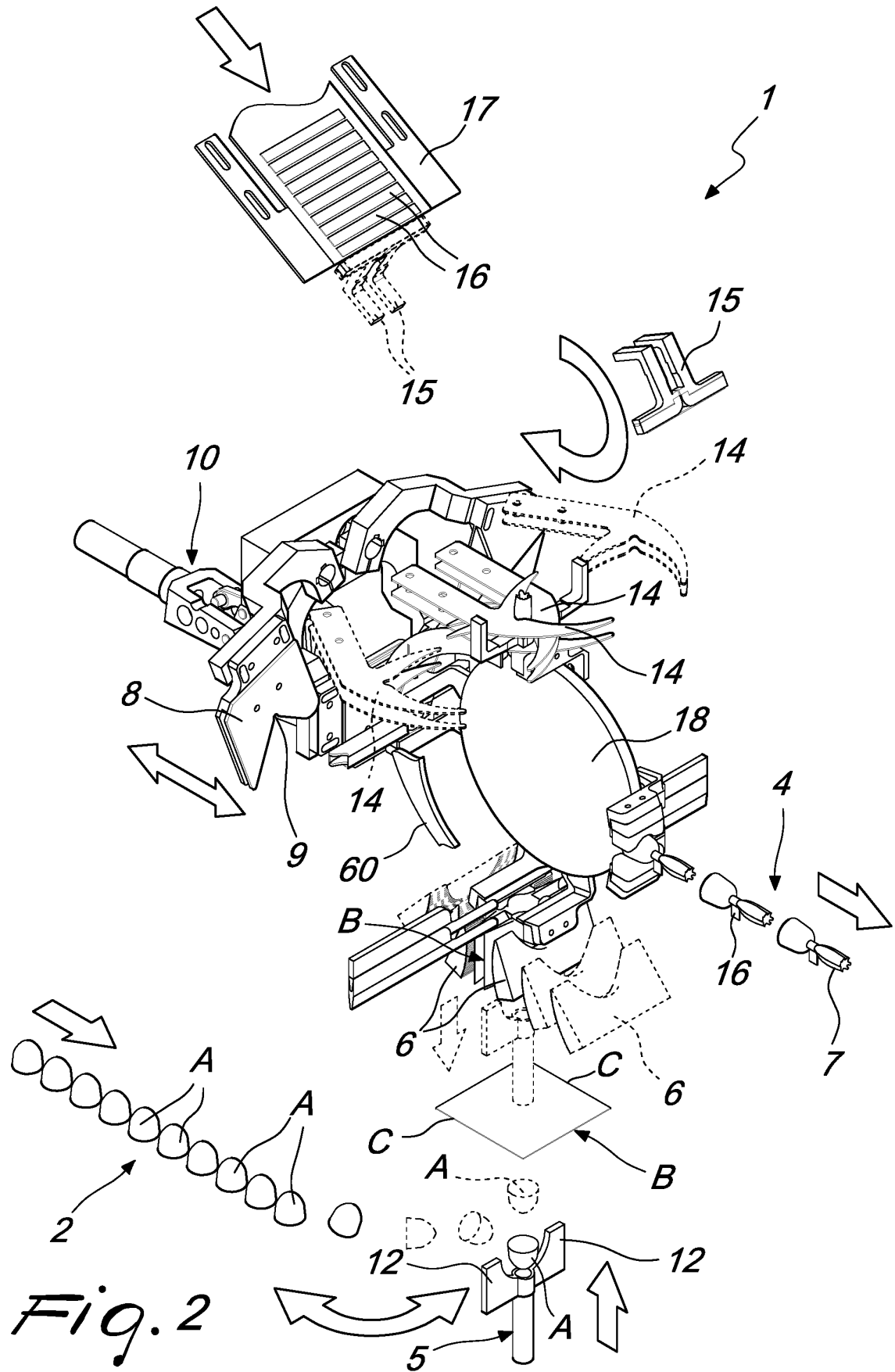
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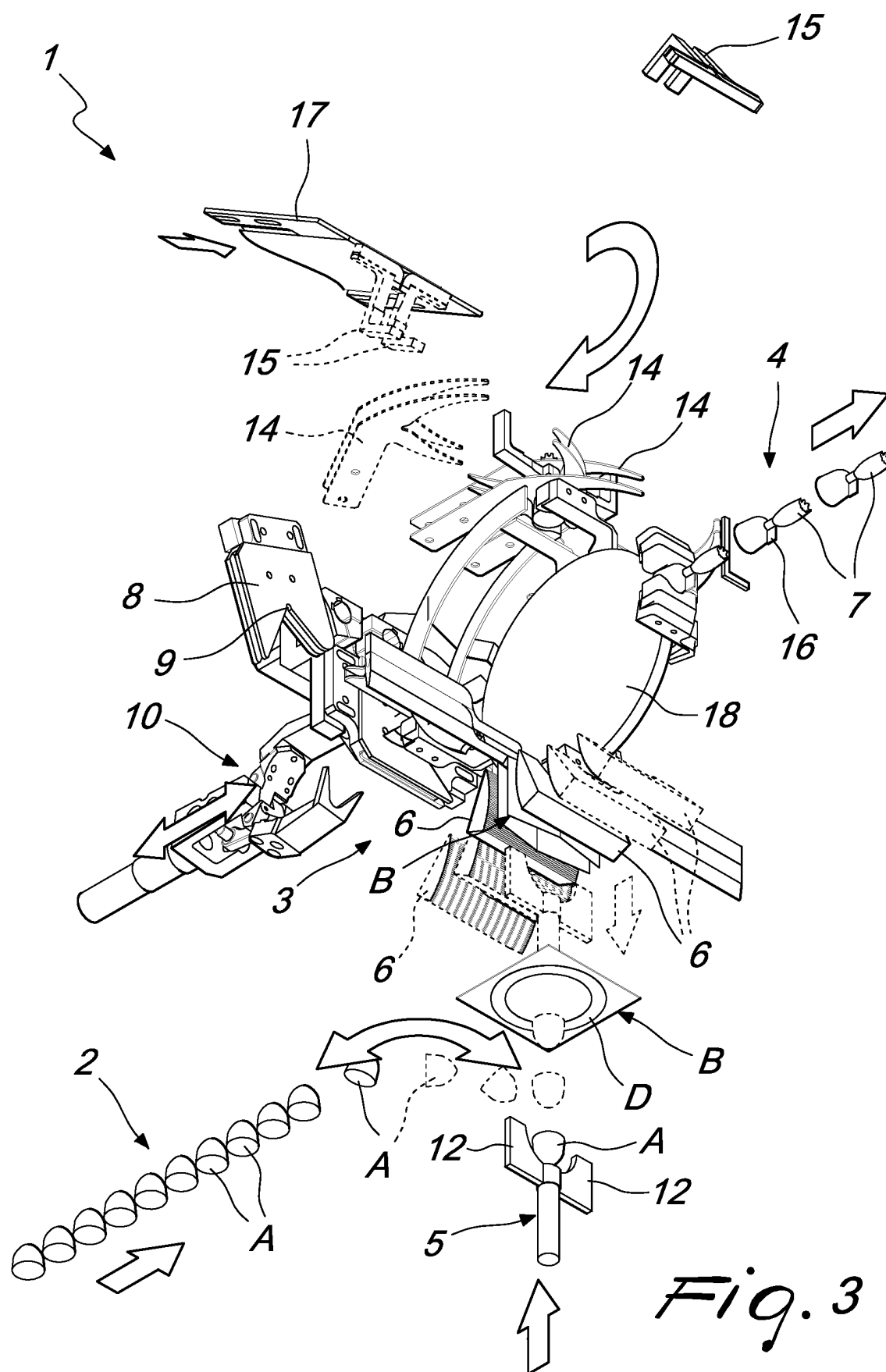
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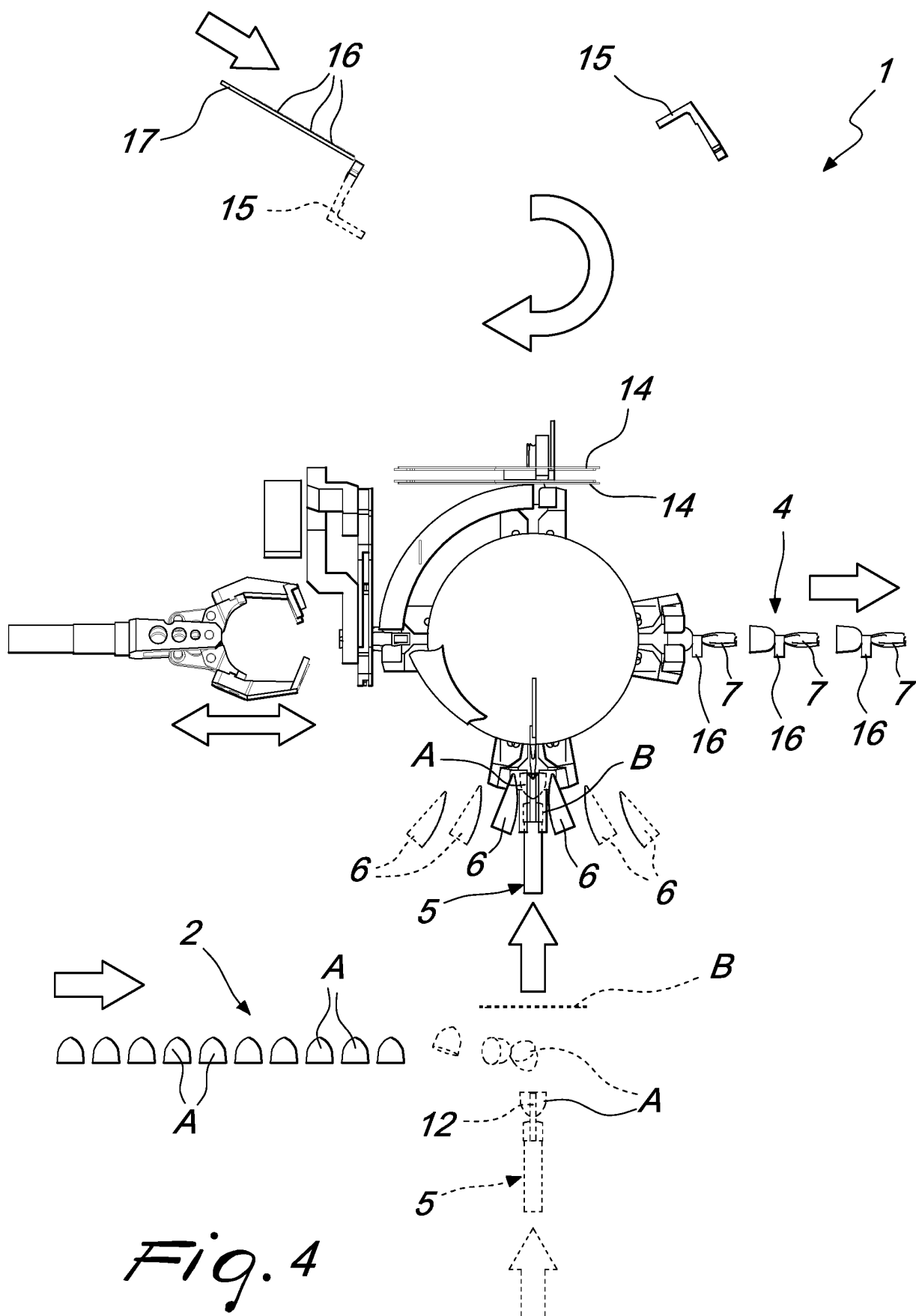
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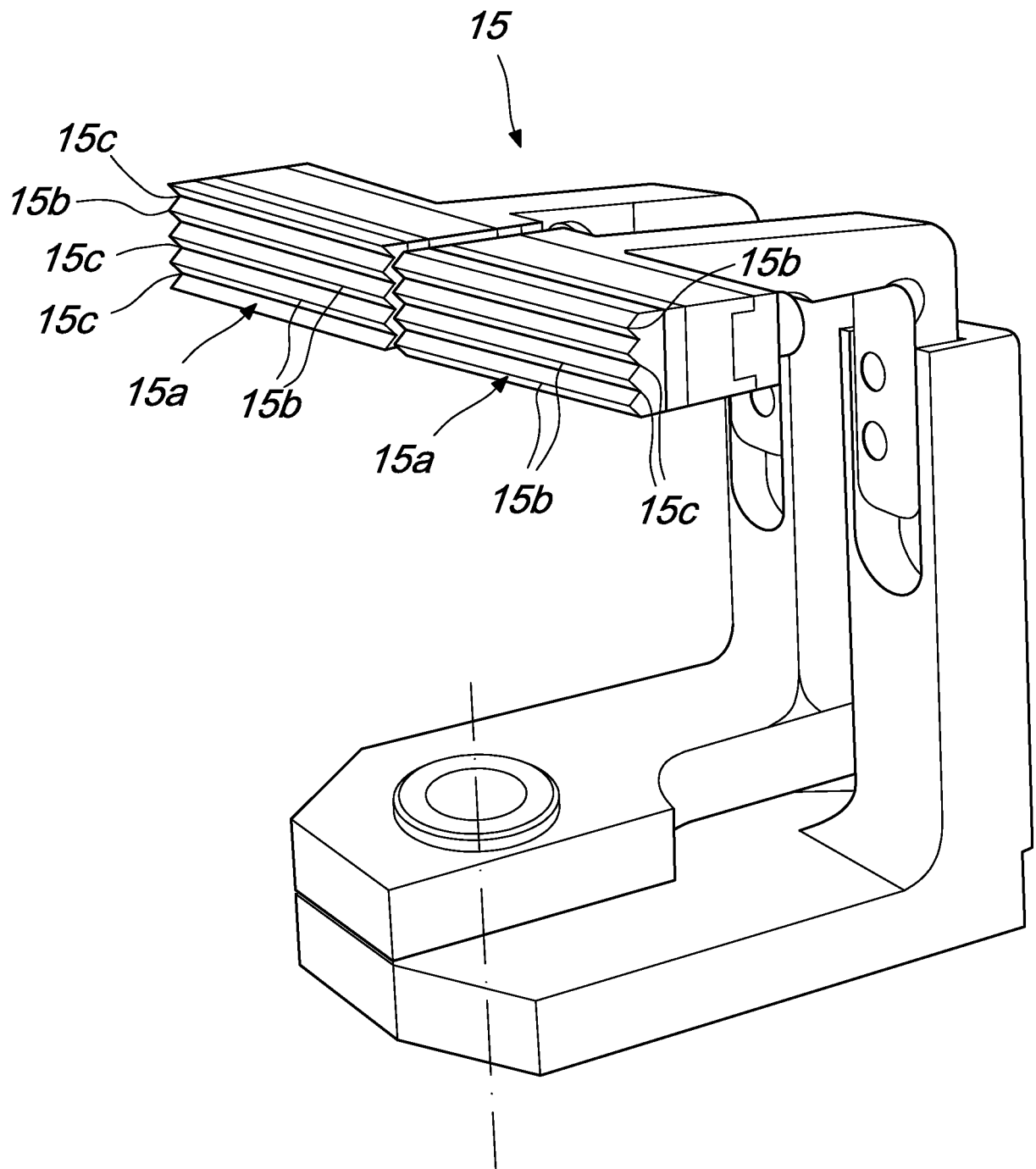


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1897810 A [0008]